WIRELESS, LIKE YOU NEVER HEARD IT BEFORE

Intelligent, adaptive signal processing can enhance wireless communications, helping to increase system capacity and improve signal quality.

■ ArrayComm's IntelliCell® technology is the driving force behind a new generation of intelligent base stations (pictured above) soon to be deployed widely in the Japanese market.

Take a mobile car phone, and shorten its range. What you have is a lot like the service provided by low-mobility wireless systems, the next big thing in telecommunications. These systems are intended for customers who need "walkaround" wireless access in a limited geographic area, such as a local neighborhood or business campus.

Unfortunately, some drawbacks, such as interference and capacity, have limited the growth of this wireless service. For example, in densely populated areas, crosstalk from other cellular signals can seriously degrade signal quality. Multipath interference, caused by the physical features of the urban landscape, also distorts signals.

ArrayComm, Inc. (San Jose, CA), is marketing systems that enhance wireless communication systems by maximizing signal quality while minimizing interference. Using BMDO-funded advanced radar signal-processing technology that originated at Stanford University, ArrayComm has developed a suite of algorithms to discriminate between multiple radio signals operating on the same frequency. The technology, called IntelliCell®, selectively receives radio-frequency energy from, and transmits it to, multiple users in the same "cell" simultaneously.

Virtual wires. The IntelliCell process creates "virtual wires" that establish and maintain optimal connections between each subscriber and a base station. The key technologies consist of a methodology for siting multiple transceiver antennas, algorithms for processing the signals from the array, and software to control the signal processing functions. By applying intelligent control of the individual antennas, the system can selectively transmit radio frequency (RF) signals to the receiver; it can also selectively "listen" to the mobile transmitter, mitigating interference signals from other RF sources.

"IntelliCell techniques dramatically enhance wireless service quality, coverage, and capacity on a real-time basis," says ArrayComm's Dr. Richard Roy, the scientist who spearheaded the original technology development at Stanford. "The result is an unprecedented savings in infrastructure and operating costs." ArrayComm reports that because fewer base stations are needed, IntelliCell can help reduce infrastructure investments by up to 50 percent over conventional

base station approaches. Operating costs, such as those associated with power and equipment maintenance, would also be reduced.

In its first commercial application, IntelliCell technology is being deployed in Japan's Personal Handyphone System (PHS), a low-mobility personal communications system introduced in 1995. PHS is marketed on its low-cost, high-quality service; lightweight handsets; and long battery life—all attributes that IntelliCell technology can further enhance. Collaborating with Kyocera Corporation in Japan, ArrayComm initially incorporated IntelliCell technology into 30 base stations in Tokyo for Kyocera's customer, DDI Pocket Telephone, the largest PHS service provider in Japan. Test results pointed to superior voice quality with an estimated four- to five-fold increase in network capacity. Full-scale deployment is under way.

Ever so popular. With the success of the testing program, ArrayComm and Kyocera recently finalized an agreement to manufacture and commercialize IntelliCell-equipped base stations. DDI also placed an order for 1,000 such units. DDI Pocket provides service for an estimated 3.5 million Japanese subscribers, making it the largest PHS carrier in the world. In addition, Kyocera currently ranks first of 16 manufacturers in the PHS handset market, with a 25 percent share.

In the longer term, ArrayComm projects an expanding market share for wireless local loop (WLL) systems to more than half the entire wireless business volume by the year 2000. WLL products are intended for rapid deployment of local telephone services in less-developed countries lacking wire-based telephone switching networks. They enable many telephones in a local area to communicate using a single base station. Because WLL can be easily installed, it is particularly attractive for use in rural settings.

ArrayComm is now marketing an IntelliCell WLL system called IntelliWave especially for this remote market. The company has established relationships with strategic partners in Asia, Europe, and South America. For example, it recently signed a partnership agreement with Brazil-based Zetax Tecnologia S.A. (ZETAX) that establishes ZETAX as a distributor of ArrayComm's IntelliWave product in Brazil.

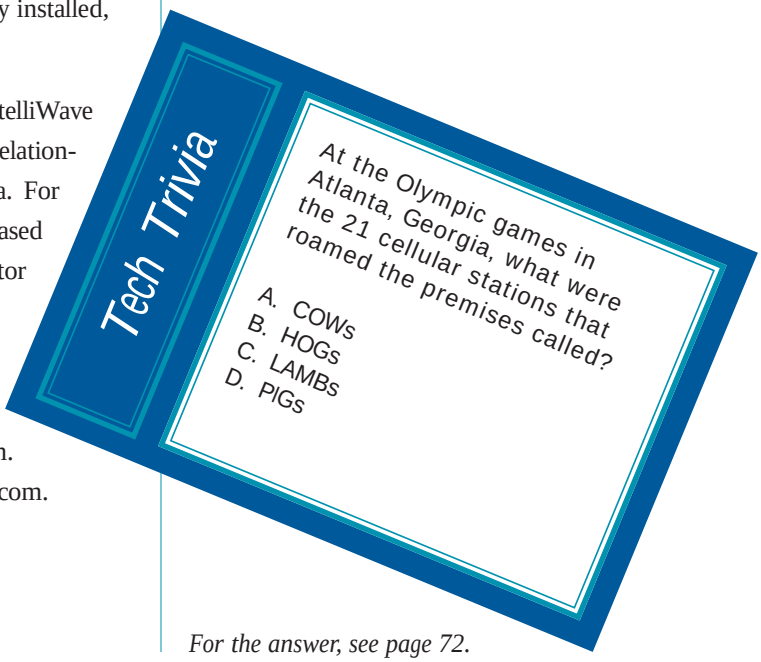
■ For more information, contact Christine M. Oliver via telephone at (408) 428-9080 or via E-mail at chriso@arraycomm.com. You can also visit ArrayComm's Web site at http://www.arraycomm.com.

What Does It Mean to You?

IntelliCell technology will sound great to wireless subscribers because it reduces static and interference and ultimately lowers handset and service costs.

What Does It Mean to Our Nation?

With its performance, range, and cost advantages, IntelliCell technology could help U.S. wireless providers thrive in this intensely competitive market.



For the answer, see page 72.